Maternal and Childhood Lead Exposure

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Support for Families from F2F/FV

- Family Voices
- Family to Family Health Information Centers
- Family resources
  - Center for Parent Information & Resources
  - MCH toolkit
- Training and Empowerment of families:
  SPAN Parent Advocacy Network: Empowering Women in Leadership for Healthier Families, Project Director Nicole Pratt

Family Empowerment in New Jersey

1. What were the NJ focus groups about?
2. The focus groups helped inform a training curriculum – what was the training about?
3. How will the families be supported to continue in a leadership role with families who may have lead exposure risk?

OTIS/MotherToBaby

- Organization of Teratology Information Specialists / professional society
- Service arm of MotherToBaby with local affiliates,
  - www.mothertobaby.org
  - @mothertobaby
- 14 regional centers in US and Canada
- Telephone 866-626-6847, text, chat, email

Risk Assessments

- Risks of medications, herbals, cosmetics, chemicals, etc.
- Risks of untreated conditions
- Twice monthly Seminars, review original studies
- Subscription databases (Reprotox, Medications & Mother's Milk, TERIS)
- Free databases (LactMed)
- Other centers, OTIS & ENTIS members worldwide, www.entis-org.eu
- Other information (pharmacology, clinical cases, etc.)
- Principles of Teratology (dose, timing, etc.)

Background Risks

- 3-5% risk for major birth defect
- 10-15% risk for minor defect
- 15-20% risk for miscarriage
- 5-25% risk for developmental delay or learning problems

Support for States from MTB

- Answer questions about exposures from
  - Mothers
  - Providers
  - Grantees/States (FV, F2F, Title V, MIECHV, PTI, etc.)
  - Partnerships
- Provide resources
  - www.mothertobaby.org/lead
  - www.medicalhomeportal.org
    - Childhood Lead Exposure
    - Maternal Lead Exposure

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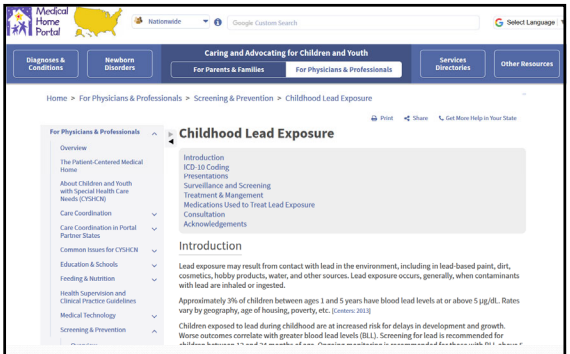
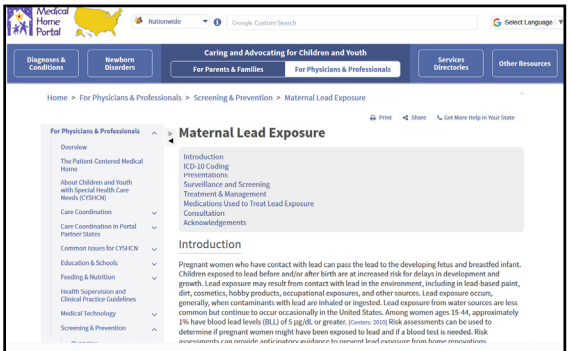


- **https://www.medicalhomeportal.org/clinical-practice/screening-and-prevention/childhood-lead-exposure**



- **https://www.medicalhomeportal.org/clinical-practice/screening-and-prevention/maternal-lead-exposure**

ACOG Risk Factors

- Emigration from other countries with high lead levels
- Living near sources of lead (mines, smelters, etc.)
- Working with lead, occupational, hobbies (firearms, stained glass, construction, batteries, etc.)
- Eating non-food items (pica)
- Imported herbals, cosmetics, foods
- Home remodeling (homes before 1978)
- Water (Utah case)
- Previous exposure
- Living with someone with high lead level (shared exposure)

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Symptoms

- May not have symptoms if high level is below 45 µg/dL
- Low iron (anemia)
- High blood pressure
- Abdominal pain, constipation
- Headache, tiredness
- Weakness, numb hands or feet
- Confusion
- Seizures
- Coma, death

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Outcomes for Child

- Remember, lead passes through the placenta and breastmilk which may cause:
  - Developmental delays (intellectual, learning, neurodevelopmental, etc.)
  - Anemia
  - Decreased growth

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Screening and Testing

- Recommended (CDC, ACOG, AAP) vs. Required (Medicaid, some states)
  - Assessments (list of questions) (required in NY)
  - Screening (blood test, may be finger/capillary)
  - Follow-up Testing (blood test, venous)
- ACOG recommends case management for women BLL above 15 µg/dL

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Various Guidelines

BLL[2]	EVALUATION AND TESTING	MANAGEMENT
< 5 mcg/dL Initial BLL and routine retest may be capillary (CBLL) or venous (VBLL) [3,4] **Retest for identified risk must be venous**[3]	**General** ▪ Perform routine history and assessment of physical and mental development. ▪ Assess nutrition and risk for iron deficiency. ▪ Consider lead exposure risks. **Blood Lead Levels** ▪ California regulations require testing at ages 1 and 2 years (up to 6 years if not tested at 2 years) if child is in a publicly funded program for low-income children, spends time at a pre-1978 place with deteriorated paint or recently renovated, or has other lead exposure risks.[5] ▪ If screened early (before 12 months), retest in 3-6 months as risk increases with increased mobility. ▪ Test anyone birth to 21 years when indicated by changed circumstances, identification of new risks, or at the request of a parent or guardian. ▪ Follow up with VBLL in 6-12 months if indicated. ▪ See federal guides for Head Start[6] or refugees.[7]	▪ Comply with California regulations mandating a standard of care under which the health care provider, at each periodic health care visit from age 6 months to 72 months must give oral or written anticipatory guidance to a parent or guardian, including at a minimum that children can be harmed by lead, are particularly at risk for lead poisoning from the time they crawl until 72 months old, and can be harmed by deteriorating or disturbed paint and lead-contaminated dust.[5] ▪ Discuss hand to mouth activity, hand washing, and sources of lead: e.g. lead-contaminated paint, dust, and soil (particularly near busy roads), plumbing, a household member's lead-related work, bullets, fishing sinkers; and also some: remedies, cosmetics, food, spices, tableware, cookware, batteries, jewelry, toys, and other consumer products. ▪ Discuss BLLs with family. Counsel on any risk factors identified. ▪ Encourage good nutrition, especially iron, vitamin C, and calcium. Consider referral to Supplemental Nutrition Program for Women, Infants, and Children (WIC). ▪ Encourage participation in early enrichment activities. ▪ **Chelation is not recommended in this BLL range.**
5-9 mcg/dL Initial BLL may be capillary or venous **Every retest must be venous**[3]	**General – Evaluate as above AND** ▪ Take an environmental history to identify potential sources of exposure and provide preliminary advice on reducing/eliminating them. ▪ Test for iron sufficiency (CBC, Ferritin, and CRP). ▪ Perform structured developmental screening evaluations at periodic health visits as lead effects may manifest over years. ▪ Evaluate risk to other children and pregnant and lactating women in the home. **Blood Lead Levels** ▪ Retest in 1-3 months to be sure BLL is not rising. ▪ Then retest in 3 months and thereafter based on VBLL trend. ▪ If retest is in another range, retest per that range.	**Manage as above AND** ▪ Counsel on nutrition, iron, vitamin C, and calcium. Encourage taking high-iron and high-vitamin C foods together. Refer to WIC. ▪ Treat iron insufficiency per AAP guidelines. Consider starting a multivitamin with iron. ▪ Add notation of elevated BLL to child's medical record for future neurodevelopmental monitoring. ▪ Refer to an early enrichment program, e.g. Early Start or Head Start. ▪ Consider medical referral and testing for other children and pregnant and lactating women in the home. ▪ Coordinate with local Childhood Lead Poisoning Prevention Program (CLPPP) or state CLPPB for outreach, education, and other services. See www.cdph.ca.gov/programs/CLPPB for state and local contact information. ▪ **Chelation is not recommended in this BLL range.**
10-14 mcg/dL Initial BLL may be capillary or venous	**General – Evaluate as above** **Blood Lead Levels** ▪ Retest in 1-3 months to be sure BLL is not rising. ▪ To determine eligibility for full public health case management, retest after interval of 30 days (eligible if persistent in or above	**Manage as above AND** ▪ If BLL is persistent in or above this range (30 days or more), contact the local CLPPP (or, if no local program, the state CLPPB) for full case management services, without charge or means test, for children aged birth to 21 years (nurse case management, environmental investigation, and recommendations for remediation of lead sources)

Table 1. Frequency of Maternal Blood Lead Follow-up Testing During Pregnancy

Venous Blood Lead Level* (micrograms/dL)	Perform Follow-up Test(s)†
Less than 5	• None (no follow-up testing is indicated)
5–14	• Within 1 month • Obtain a maternal blood lead level‡ or cord blood lead level at delivery
15–24	• Within 1 month and then every 2–3 months • Obtain a maternal blood lead level‡ or cord blood lead level at delivery • More frequent testing may be indicated based on risk factors
25–44	• Within 1–4 weeks and then every month • Obtain a maternal blood lead level‡ or cord blood lead level at delivery
45 or more	• Within 24 hours and then at frequent intervals depending on clinical interventions and trend in blood lead levels • Consultation with a clinician experienced in the management of pregnant women with blood lead levels in this range is strongly advised • Obtain a maternal blood lead level or cord blood lead level at delivery

*Venous blood sample is recommended for maternal blood lead testing.

†The higher the blood lead level on the screening test, the more urgent the need for confirmatory testing.

‡If possible, obtain a maternal blood lead level before delivery because

Maternal Treatment/Mgmt

- Contact local lead program
- Remove the source or remove patient from the source
- Avoid re-exposure
- Lead is stored in bones
- Maternal levels will change during pregnancy, U curve
- With calcium deficiency, lead gets pulled out of the bone and into the fetus, provide calcium and iron
- Usually should avoid chelation in mom (unless levels higher, expert consultation), as it increases blood levels (from bone) and fetal exposure to higher levels

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Breastfeeding

- Test infant at birth if mom BLL greater than 5 µg/dL, see guidelines below for follow-up testing
- No need to measure levels in milk
- Breastfeed if maternal BLL is less than 40 µg/dL and child BLL ≤ 5 µg/dL
- Use infant powder formula reconstituted with cold tap water (not hot) after flushing for 3 min or with bottled or filtered water
- "Parents should avoid baby food products that contain ingredients testing high in heavy metals, such as rice products." House Oversight and Reform Subcommittee on Economic and Consumer Policy

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Child Treatment/Management

- Remove the source or remove patient from the source
- Avoid re-exposure
- Chelation (under expert's care) considered if BLL greater than 45 µg/dL
- There are advantages and disadvantages with using different chelation agents, some are used only in the hospital, consult an expert

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Case Mgmt. / Care Coord.

- Coordinate between medical home, family, and others
- Determine local, state laws, policies
- Use national guidelines in absence of stricter local or state laws/policies
- Follow schedule for
  - Assessment, screening, follow-up testing
  - Patient education, nutritional/vitamin support

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Case Mgmt. / Care Coord.

- Coordinate with early childhood programs as needed
  - Early Intervention
  - Early Head Start
  - WIC
  - Home Visiting
- Coordinate standardized developmental screening
- Coordinate with local programs as appropriate
  - Health department, lead program
  - Green and Healthy Homes

Case Mgmt. / Care Coord.

- Check testing procedures
- Determine/contact local experts in management of lead exposure, chelation
- Coordinate treatment, care for side effects
- Coordinate family education & support
  - Parent Training & Information Centers
  - Family-to-Family Health Information Centers

Care Coordination

- Does your medical home team have a:
  - Dedicated Care Coordinator
  - Family Partner
- Visit https://www.medicalhomeportal.org/clinical-practice/care-coordination
  - Information about Care Coordination
  - Tools
  - Helpful hints

Improving Your Medical Home

- MedicalHomePortal.org
- Website for professionals and families
- Standardized developmental screening tools
- Diagnoses (diagnosis, treatment, tools, etc.)
  - Intellectual disability
- Family Partnerships (information, tools, tips, etc.)
- Local services and informational links, partnerships with other states available

Case Study: Possible Occupational, Hobby, and Home Lead Exposure

- Mom is a police officer and 6 weeks pregnant with her first baby
- Mom and dad enjoy hunting and target shooting, dad loads his own bullets in their backyard shed
- They live in a house built before 1978 as part of the program that offers discounted mortgages for police officers (HUD Good Neighbor Next Door)
- Another police officer warned mom about the dangers of lead exposure

Case Study

- Discuss risks of lead exposure with mom
- Refer to OB provider for blood lead level testing
- Refer to local lead/housing program for home testing
- Recommend mom
  - Continue to wear mask at firing range (COVID-19 protocol)
  - Wash hands after shooting and before eating
  - Change clothes, wash clothes separately after shooting (or with dad's clothes from loading bullets/shooting)
  - Avoid loading bullets

Case Study

- OB monitor mom's blood lead level during pregnancy
- Refer to Home Visiting to determine eligibility
- Refer to Family Voices to determine other local resources that may be needed/helpful
- Medical Home check baby's blood lead level when born and provide developmental screening
- Refer to Early Intervention if baby's level is elevated

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Questions?

- Organization of Teratology Information Specialists / MotherToBaby
- Telephone 866-626-6847
- www.mothertobaby.org/lead for text, chat, email

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MotherToBaby

MotherToBaby is a service of the non-profit Organization of Teratology Information Specialists and is dedicated to providing evidence-based information to mothers, health-care professionals, and the general public about medications and other exposures during pregnancy and while breastfeeding. Cited by the CDC as a resource for information, our members collaborate on research, publish patient fact sheets, and facilitate education and training in teratology.

Call us at: 1-866-626-6847 or visit us at: http://www.mothertobaby.org/

If you are interested in learning more about MotherToBaby membership, please email Nicole Greer at: ngreer@mothertobaby.org. Member benefits include access to other professionals regarding rare exposures, member's-only section of the website, annual meeting discounts, voting rights, and membership on committees and the board.

FAMILY VOICES®

Family Voices is a national family-led organization of families and friends of children and youth with special health care needs (CYSHCN) and disabilities. We connect a network of family organizations across the United States that provide support to families of CYSHCN. We promote partnership with families at all levels of health care–individual and policy decision-making levels—in order to improve health care services and policies for children.

Family-to-Family Health Information Centers (F2Fs) are family-led centers funded by the Health Resources and Services Administration (HRSA). There is one F2F in each state, in the District of Columbia, in five U.S. territories, and there are three F2Fs serving tribal communities. Each F2F is staffed by highly-skilled, knowledgeable family members who have first-hand experience and understanding of the challenges faced by families of CYSHCN. These uniquely qualified staff provide critical support to families caring for CYSHCN, particularly families of children with complex needs and those from diverse communities. F2Fs also assist providers, state and federal agencies, legislators, and other stakeholders to better understand and serve CYSHCN and their families.

Visit us at: https://familyvoices.org/lfpp/f2fs/